

# Greater Sage-grouse Ecology

Governor's Sage-grouse Advisory  
Council  
May 22, 2013

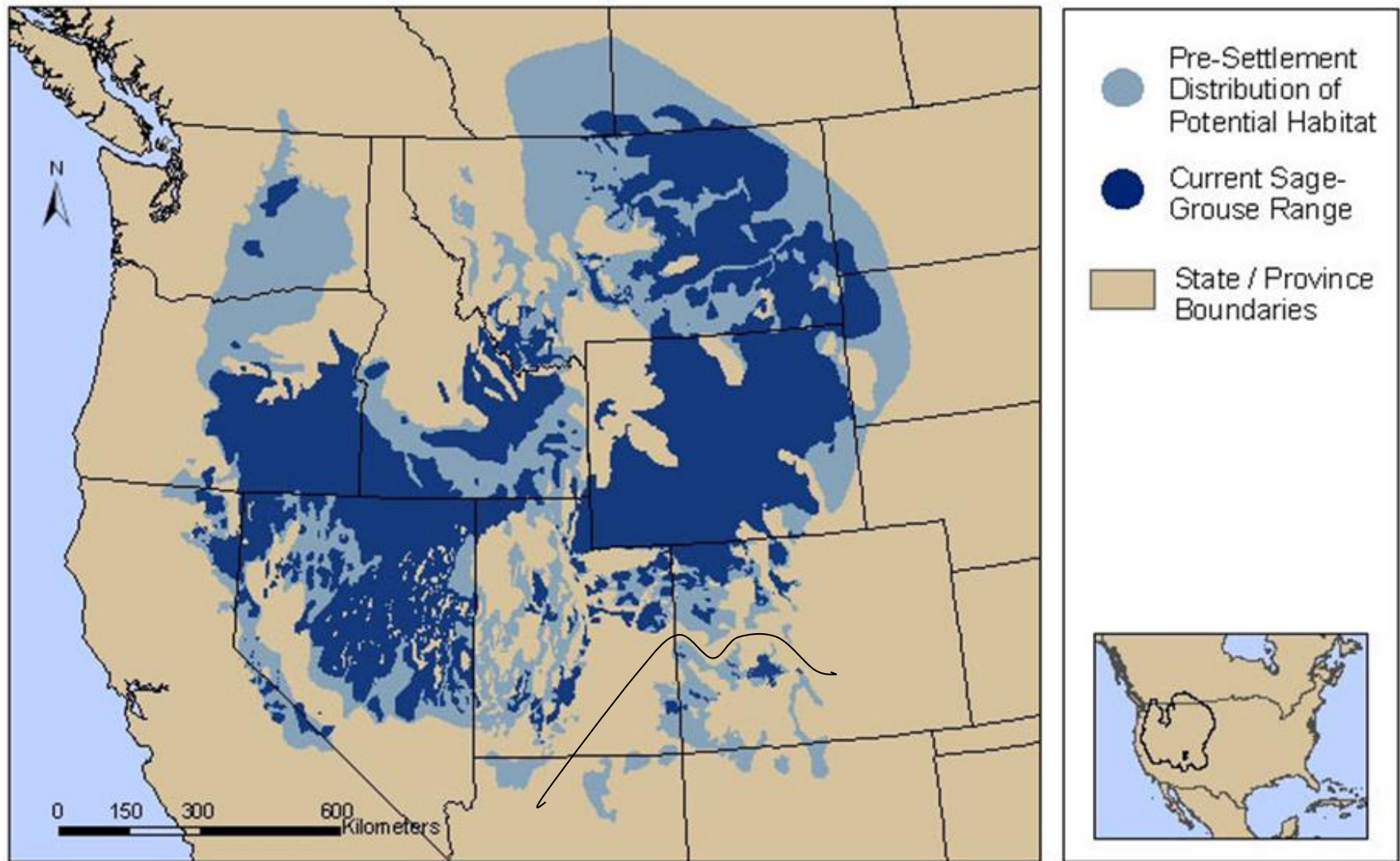


# Sage-grouse Ecology

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- ◉ Overview
- ◉ Movements
- ◉ Breeding season
- ◉ Summer season
- ◉ Winter season
- ◉ Survival
- ◉ Large, intact, interconnected habitat

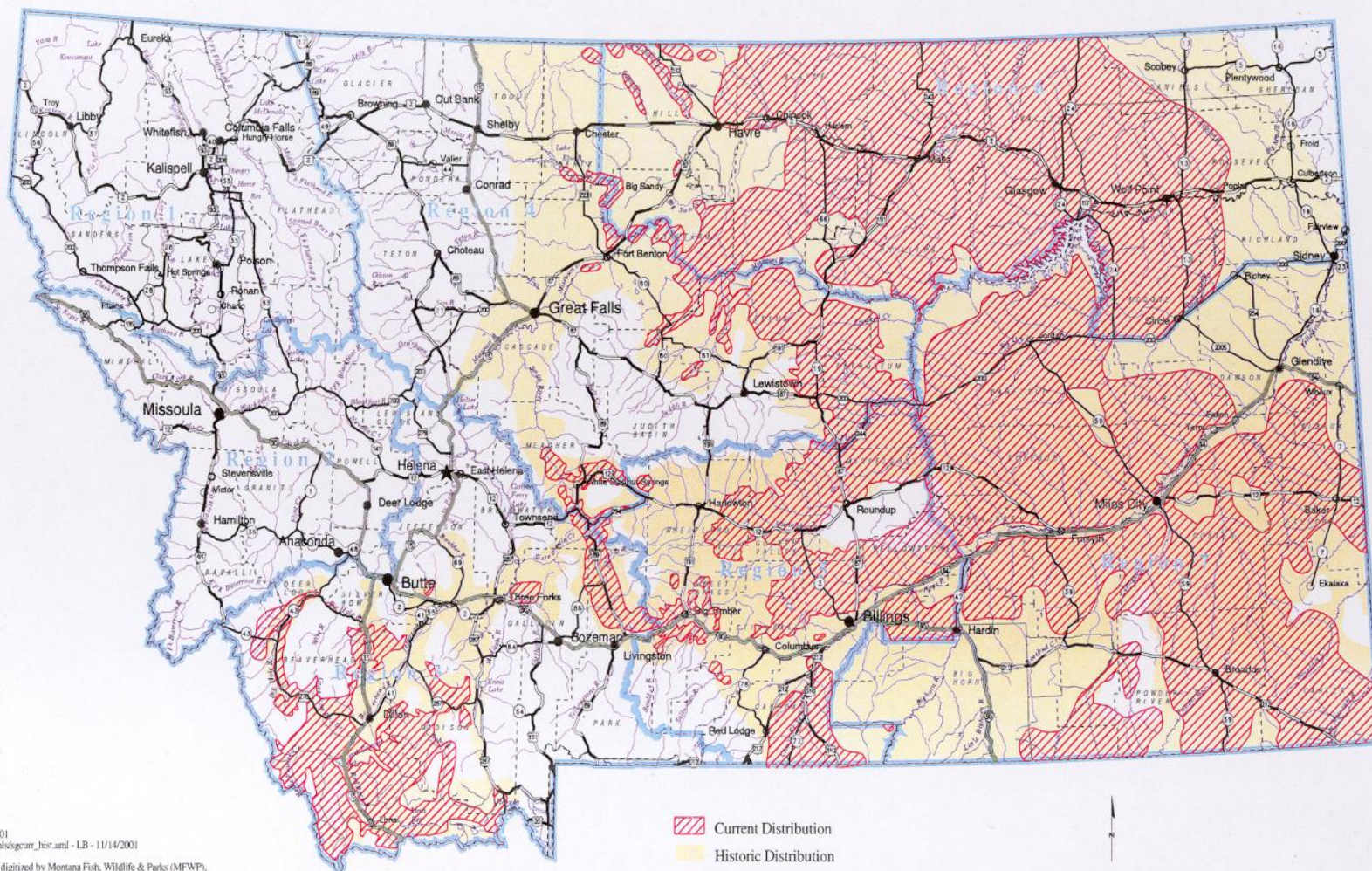




(USGS image, based on Schroeder et al. 2004)



# Current and Historic Sage Grouse Distribution - Montana



Map produced by:

Montana Fish, Wildlife & Parks  
Information Services Unit  
490 N. Meridian Rd.  
Kalispell, MT 59901

sgdist\_curr.cmp - LB - 11/14/2001  
c:\wildlife\game\sage\_grouse\amis\sgcur\_hist.aml - LB - 11/14/2001

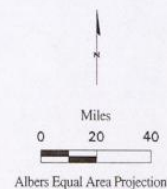
Current sage grouse distribution digitized by Montana Fish, Wildlife & Parks (MFWP), Information Services Unit, Kalispell, MT. The sage grouse data depicted on this map were quality checked in May, 2001 by Bureau of Land Management (BLM) and MFWP wildlife biologists.

Historic sage grouse distribution is based on the following four sources:

1. Information from the Upland Game Bird Section of the Biennial Report, Montana Fish and Game Commission, 1941-1942.
2. Locations of known sage grouse habitat from literature search.
3. Counties with at least one season for sage grouse from Fish and Game Commission Meeting notes dated May 13, 1926 - August 13, 1956.
4. Schroeder, M.A. April 1999. Sage Grouse of North America. Unpublished GIS Layer. Scale 1:2,000,000. Washington Department of Fish and Wildlife.

All other layers from the Natural Resource Information System, Montana State Library, Helena, MT. All other layers digitized at 1:100,000.

- Current Distribution
- Historic Distribution
- Montana Fish, Wildlife & Parks Regional Boundary
- County Boundary



# Movements

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## ◉ Dispersal

- Place of hatch to place of breeding
- ~4 – 5.5 miles average

## ◉ Within season movements

- Varies, sometimes discrete, sometimes intermixed
- Greater than other game birds





# Movements

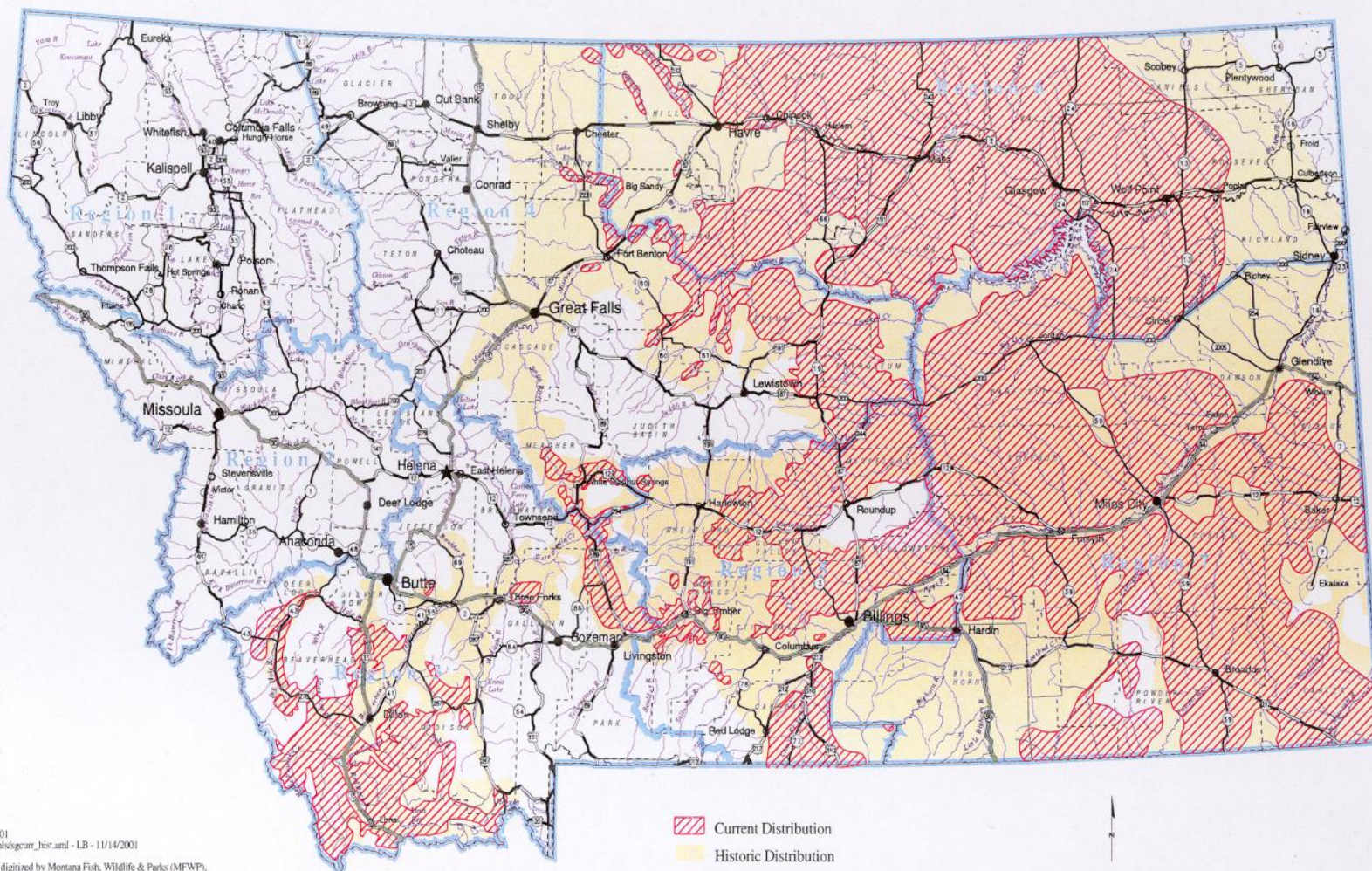
## ● Migration

- Non-migratory
  - Move less than 6.2 mi (10 km)
- One and two-stage migration
  - Move greater than 6.2 mi among two or all three seasonal habitats
- Decisions effected by habitat conditions, weather, etc.





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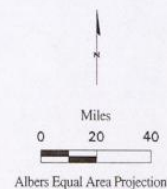
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# Movements

## ● Site fidelity

- Generally strong fidelity to leks

## ● Home range

- 1.5 – 237  $\text{mi}^2$
- Breeding and summer,  $<0.4 - 11 \text{ mi}^2$
- Winter,  $<0.4 - 75 \text{ mi}^2$





# Breeding Season

## ● Leks

- Habitat
  - Open areas
  - Proximity to nesting sites
- Traditional use
  - Up to 80+ years
  - Satellite leks
- Patterns of use
  - Adult males
    - MT long-term average = 29 males/lek
  - Females
    - Attendance peaks early – mid April
  - Yearling males
    - Attendance peaks 3 weeks later



# Breeding Season

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## ● Nesting

- Habitat
  - Sagebrush & other shrubs; residual grass
  - Usually nest within 3 mi of active lek (97% in central MT, Sika)
- Diet
  - Changes from sagebrush to forbs
- Nesting likelihood
  - 82% (71-93% in MT)
  - ~25% re-nesting attempts
- Clutch and incubation
  - 8 eggs (6-9); 27 days incubation





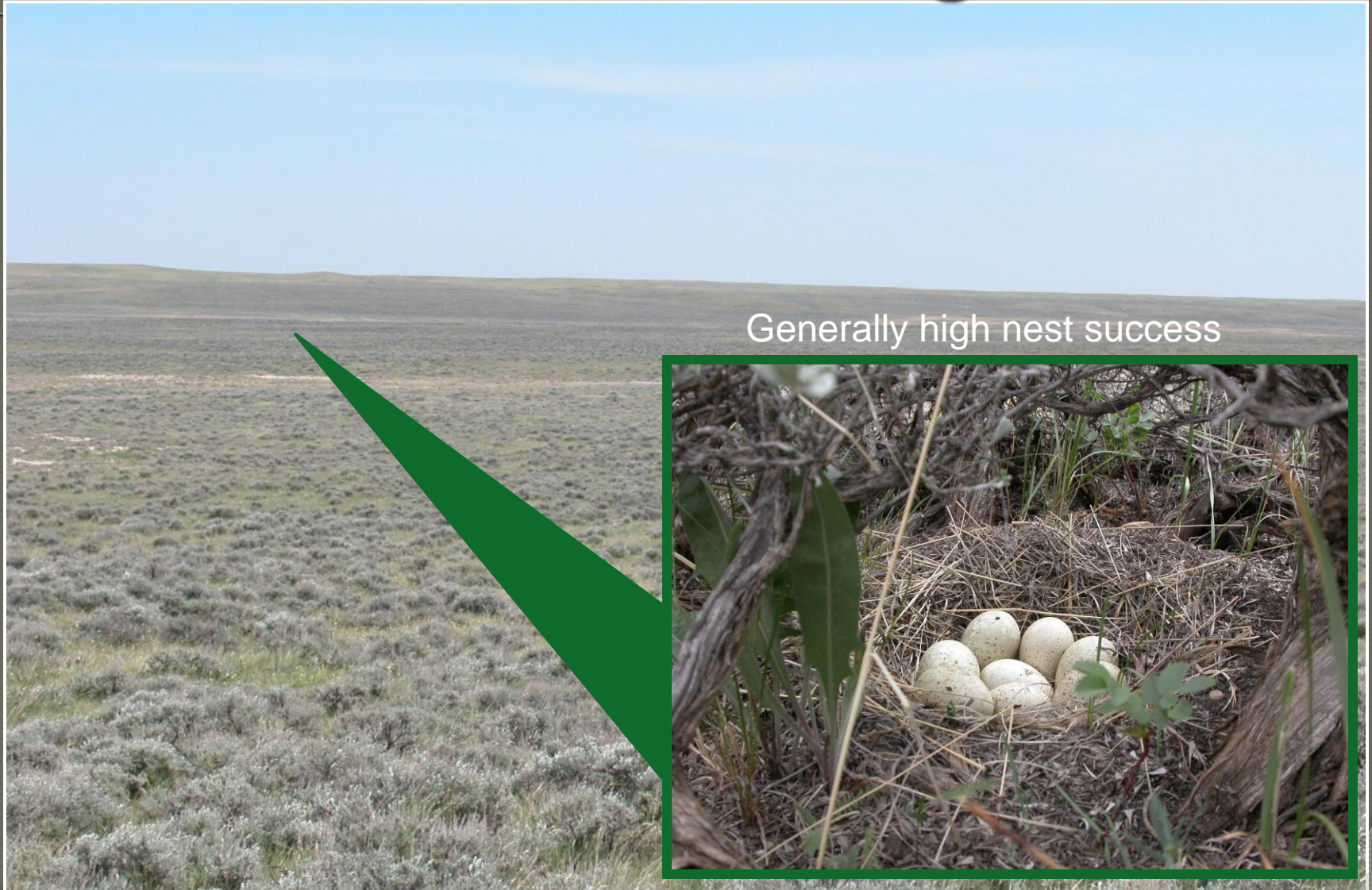
# Breeding Season

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## ◉ Nesting (cont.)

- Peak hatch
  - end of May – early June
- Nest success
  - Variable (46-70%) but comparable to other grouse
  - Higher in unaltered landscapes
  - Live & residual grass, forb cover and visual obstruction

# Breeding Season

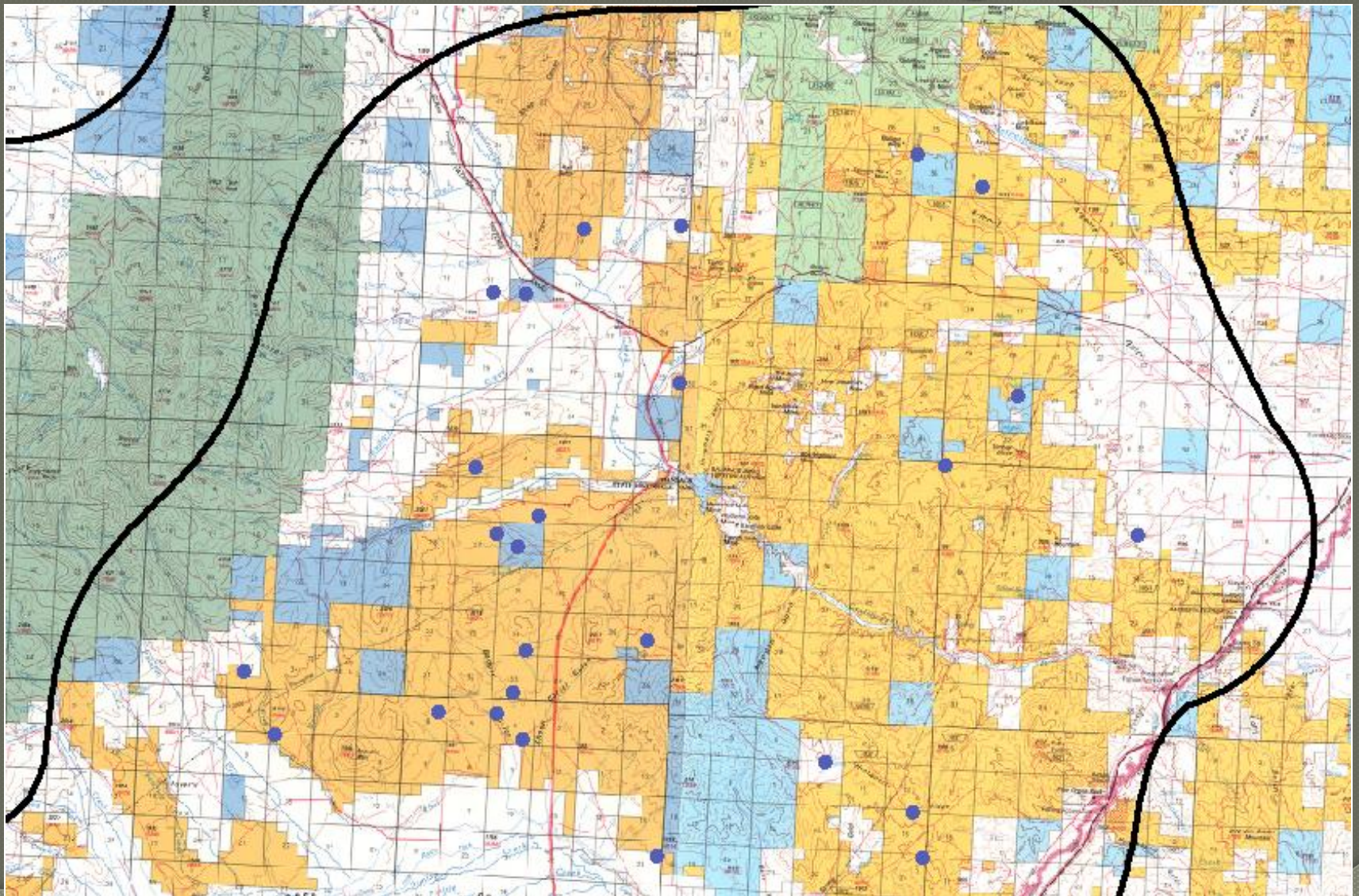


Generally high nest success





# Breeding Season





# Breeding Season

## ● Early brood-rearing

- Diet
  - Primarily insects
- Habitat
  - Taller grass, increased forb and grass cover
  - Less sagebrush cover
- Precocial young
  - Weak flight – 10 days
  - Strong flight – 5 weeks





# Summer Season

## ● Late brood-rearing

- Diet
  - Change to forbs
- Habitat
  - Riparian, wet meadow, alfalfa fields
- Movements
  - Elevation
  - Micro-site
  - Mesic years



# Winter Season

## ◉ Autumn

- Diet transitions to sagebrush

## ◉ Winter

- Diet
  - Exclusively sagebrush
- Habitat
  - Primarily found in big sagebrush
  - Height of sagebrush important
  - Use influenced by snow depth and hardness, topography, vegetation height and cover





# Survival

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- Chick

- 9-16% survival through brood-rearing

- Hen

- 50-75% survival annually

- Seasonal patterns

- Mortality greater in breeding & summer
  - Adult survival relatively high over winter (85-100%)

- Sex ratio

- Tends to favor females

- Vital rates effecting population dynamics

- Hen survival, nest success, chick survival

# Survival

## ● Leading causes of mortality

- Predation (eggs, chicks, adults)
  - Rates vary by habitat, location, weather
- Collisions (vehicles, fences, power lines)
  - 33% of mortalities in ID were with power lines
  - Population response to fence collisions found in other grouse
- Diseases
  - 2003-2007 WNV outbreaks





# Summary

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- Relative to other game birds:
  - Generally long-lived
  - Generally high over-winter survival
  - Generally lower reproductive rates
  - May move greater distances within and among seasons
  - Life history traits indicate populations may be influenced by survival more than reproduction
- May be slow to respond to changing habitat conditions

# Summary

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## ● Seasonal habitat:

- Require sagebrush habitat with tall residual grass for breeding sites
- Use riparian, wet meadows, alfalfa fields during the summer, late brood-rearing period
- Require big sagebrush in winter for cover and food resources



# Summary

- Require large, intact, interconnected expanses of sagebrush habitat

